

Astro-Physics GTOCP4 and GTOCP5 Version History and Bug Fixes

VCPx-P02-xx was developed for both the GTOCP4 and GTOCP5 control boxes. Depending on the configuration, this software can operate as a GTOCP4 to drive the servo motors of all previous mounts, or it can operate as a GTOCP5 to drive the servo-steppers of the Mach2GTO. As noted below, some of the functions and features are only appropriate for the Mach2GTO. Others are active only for the Mach2GTO at the present time, however, will be released for the GTOCP4 in the near future.

The term “encoder mounts” refers to all Astro-Physics mounts with RA and DEC absolute encoders (some 1100 and 1600 mounts and all Mach2) unless stated otherwise.

The most recent versions of the V2 ASCOM Driver, APCC and the Keypad V5 version are required to take advantage of new features.

Version VCPx-P02-08, 12/5/20

First wide release for GTOCP4

Improvements/Additions:

- Improvement in download to WiFi module.
- For Keypad: Facilitate improved automation of keypad downloads.
- For Keypad: Orthogonality modeling improvements (Mach2GTO only at this time)

Bug Fixes:

- Fix truncated network scan list from WiFi module, as shown in embedded web pages.

Version VCPx-P02-07, 10/16/20

Improvements/Additions:

- Upgrades and improvements to IP connection functionality.
- Update embedded web pages to refer to GTOCPx rather than GTOCP4. GTOCP5 users still see GTOCP4 in web pages.

Bug Fixes:

- Fix bug that requires DEC axis to also be active on startup, to get RA encoder data. (Mach2GTO)

Version VCPx-P02-06, 9/5/20

Improvements/Additions:

- For Keypad: Enablement for Internal meridian limits remembered through a power cycle. Internal meridian limits based on the encoder in the Mach2. (Mach2GTO)
- For Keypad: Further development of keypad pointing and tracking modeling feature. (Mach2GTO only at this time)

Bug Fixes:

- Account for amount of RA tracking while waiting for DEC to complete slew to home when re-calibrating.
- Fix error in Mach2 Encoder Park positions, Southern Hemisphere positions are 180 deg. off in DEC. (Mach2GTO)

Version VCPx-P02-05, 6/29/20

Improvements/Additions:

- For Keypad: Additional improvements to pointing, tracking and orthogonality models and other features for the keypad.

Bug Fixes:

- Restore stall detection in CP5, both tracking and slewing. Detection was affected by prior changes. (Mach2GTO)

Version VCPx-P02-04, 4/30/20

Improvements/Additions:

- For Keypad: Improvements in accuracy of pointing model. (Mach2GTO only at this time)

Bug Fixes:

- Eliminate stability problem resulting from bug fix in P02-03.

Version VCPx-P02-03, 3/21/20

Improvements/Additions:

- Improve legacy compatibility for updating older GTOCP4 units.
- For Keypad: Further development of pointing and tracking models. (Mach2GTO only at this time)

Bug Fixes:

- Remove erroneous clutch slippage detection from non-encoder mounts.
- Fix bug that allowed slews to accumulate small amounts of positional error when correcting with encoders.

Version VCPx-P02-02, 2/25/20

Improvements/Additions:

- Modify button rate sequence such that 0.25x, 0.5x, and 1.0x button rates correspond to **:RC5#**, **:RC6#**, and **:RC7#** respectively. This allows **:RC0#** and **:RC1#** to remain 12x and 64x resp. for backward compatibility. Previously, the slower rates were shared with guide rates.

- Improve robustness of code download web pages.

Bug Fixes: None

Version VCPx-P02-01, 2/10/20

VCPx-P02-xx is a major update that provides full support for the Mach2GTO. Depending on the configuration, this software can operate as a GTOCP4 to drive the servo motors of all previous mounts, or it can operate as a GTOCP5 to drive the servo-steppers of the Mach2GTO. Going forward, we will continue to include BOTH configurations in a single software package. There are also many new features that all users will find beneficial.

Improvements/Additions:

- Included higher precision on command responses; **HH:MM:SS.ss#** and **sDD*MM:SS.s#**. This brings precision to one hundredth of a second for hour fields like Right Ascension, and to one-tenth of an arc-second for degree fields like Declination. You must use the appropriate version of APCC or other software to utilize this precision.
- Added ability to query for the last commanded coordinates.
- Slew rates and the fastest 2 button rates are now modulated for different mounts. This allows the faster slew rate for the Mach2GTO, and slower rates for the 3600GTO and OEM mounts that use the Astro-Physics GTO Servo System (Mathis, Parallax). The appropriate rate table is indicated in the status string from the GTOCPx. This allows rate commands to remain unchanged in external software applications.
- Guide rates have been decoupled from the slowest button rates.
- Improved fault and limit reporting.
- Provisions for different gearing on RA and DEC
- Add option to park to pre-defined coordinates, or to home, on timeout of park timer.
- Added option for tracking at rate computed by the "King Equation". **:RT8#**
- Numerous improvements to IP functionality – both Ethernet and WiFi.
- Numerous improvements to the internal web pages.
 - Added additional "command set" lines to debug terminal web page, and button to Restore from Last Parked.
 - Software update improvements including better recovery from problems and text clarifications
- Extensive support for Mach2 encoder-based standard and custom park positions, re-calibration in event of initialization error and encoder-based slews. (Mach2GTO)
- Provisions for use of Stepper Motors (Mach2GTO).
- For Keypad: Added full tracking and pointing model, 128 points on each of the pier sides, for each model type. Includes orthogonality. (Mach2GTO only at this time)

Bug Fixes: None

***** **Version P01-xx for the GTOCP4 only** *****

Version VCP4-P01-14, 07/16/20

- Added support for keypad updates through bottom COM port and USB. Both 9-pin COM ports and the USB now support keypad firmware and database uploads.
- This installation package for VCP4-P01-14 also includes the : [WiFi_A404.wif](#) update

Version VCP4-P01-13, 1/14/19

- Fix bug: Corrected errors in responses to encoder status queries.

Version VCP4-P01-12, 10/22/18

- Fix bug: Slew Scaling factor incorrectly calculated when standard slew command is issued, and when slew scaling is enabled. Affected 3600s, 400/600s with 32:1 gearboxes, and some OEM mounts.

Version VCP4-P01-11, 12/19/17

- Fix bug where a meridian delay could cause an incorrect internal limit calculation if the delay crossed the LST 24/0 rollover point.

Version VCP4-P01-10, 9/17/17

- Ignore whitespace in numeric data when using terminal page of embedded browser.
- Fix bug causing erratic motion when meridian overflows from 23:59:59 to 0:00:00 during slew.
- Recognize negative sign on entry of hour-only format for GMT offset.

Version VCP4-P01-09, 8/29/17

- Backed out change in VCP4-P01-07: Hour Angle command now returns "normalized" hour-angle again. Added new command to return un-normalized representation of HA.
- Both hour angle commands now return 0:00.0 if mount has not been initialized.
- Fix bug in PEM record function to allow proper playback of PEM record "drift"
- Fix bug that corrupts Centering Rate when reading Guide Rate.
- Fix bug that results in errors introduced in the saved mechanical positions and zero'ing the meridian delay, in a power interruption that does not result in reboot of the unit (i.e. recoverable Low Voltage Warning)
- Fix bug in trim command responses.

Version VCP4-P01-08, 7/25/17

- Fix bug that prevents completion of slew in RA axis when zero tracking rate selected. Bug introduced in VCP4-P01-07

Version VCP4-P01-07, 7/21/17

- Implemented method of allowing software updates to be performed while preserving the calibration of the mount.
- Eliminate internal limit-bounce if unit powers up in internal limits.
- Bug Fix: When internal limit is active with zero tracking speed selected, fix bug that produces tracking in direction opposite sidereal rate in RA axis.
- Bug Fix: Fixed issue of rounding up 59+ seconds in seconds field, to 60 in both DDD*MM:SS and HH:MM:SS formats.

Version VCP4-P01-06, 6/15/17

- Internal limits added. Fixed RA limits at hour-angles that position the counter weights straight up. Fixed DEC limits at 180 degrees from the pole.
- "Page not Found" web page auto-redirects to main page.
- Bug Fix: Auto-Guide moves superimposed on zero tracking rate produce proper rates.
- Bug Fix: Keypad download support restored, bug introduced in VCP4-P01-04 (COMM2 and Keypad serial interfaces logically swapped)

Version VCP4-P01-05, 04-18-17

- Bug Fix: Absolute Encoder based "Go Home" (\$HA# command) function fails to complete move in DEC axis. Bug introduced in VCP4-P01-04.

Version VCP4-P01-04, 03-08-17

- Safety slew/ meridian delay now allows delay of +/- 11:59:59.
- Improved accuracy of RA/DEC readings in standard servo loop.
- Add web page entry for indicating WiFi Firmware revision in Advanced WiFi Settings page.
- Allow WiFi Module firmware updates from web browser or serial (Ymodem).
- Extensive restructuring.
- Improved reliability in startup when no wifi network is available.
- Bug Fix: Improved recovery from lost WiFi network connection, in concert with WiFi firmware revision A402.
- Bug Fix: Joining or leaving a WiFi network from the web-page occasionally resulted in hung GTOCP4.
- Bug Fix: "EW" field reversed in status string (:GOS#) command response.

- Bug Fix: List of available networks web-page occasionally failed to update after joining or leaving a network.

Version VCP4-P01-03, 10-28-16

- Improve accuracy of gear angle command responses.
- Allow use of encoders to trim the pointing at the end of a slew, enabled separately from tracking corrections.
- Fixed bug that prevented DEC centering rate from updating when using :Rcxxx# command.
- Fixed bug in handling of blocked command sets received on a network port in some situations.

Version VCP4-P01-02, 09-28-16

- Added command to allow slew without "safety slew" logic.
- Added support for 3600GTO Precision (incremental) encoder on RA axis, used for tracking corrections.
- Included Home and Limit Switch support for the GTOCP4 as it was with the with GTOELS box.
- Added support for independent RA and DEC centering rates, intended for future use with joy-stick controllers.
- Bug fix: Update DEC centering rate when guide rates are selected to make it function the same as RA and same as in GTOCP1/GTOCP2/GTCOP3.

Version VCP4-P01-01, 07-12-16

- Include signal strength in table of available Wi-Fi networks when using browser to connect the GTOCP4 to a Wi-Fi network. This will assist in adjusting the GTOCP4 Wi-Fi antenna for optimal reception. Added serial command to provide strength of currently joined Wi-Fi "hot spot".
- Force retention of IP addresses when re-booting during a web browser-based download, by not issuing a DHCP request as a client.
- DHCP server mode does not provide a default gateway in the DHCP reply. Done to avoid problems of PC not knowing whether a given subnet is accessed locally on one interface, or through a gateway on another interface.
- Software downloads using Wi-Fi disabled due to unreliable nature of Wi-Fi.
- Bug fix: Include timed moves in PEM correction recording.
- Bug fix: If DHCP client times out, apply default IP address, subnet and default gateway.
- Bug fix: Upload/download of PEM curves using Ethernet can be done without intermittent Servo Fault indication.
- Bug fix: To prevent overlap in buffering for different communication interfaces.
- Bug fix: No longer hangs if CP4 is scanning available Wi-Fi networks and more than 10 are available.
- Bug fix: Command returns correct Wi-Fi MAC address when unit has joined a Wi-Fi network.
- Bug fix: When setting Absolute Encoder home, reset encoder correction loop to avoid trying to correct for a 360 degree error when starting with an encoder position outside 0-360 degree range.
- Bug fix: PEM programming offset is correctly computed.

Version VCP4-P01-00, 05-06-16, Initial Release